Correlation of mRNA Profiles, miRNA Profiles, and Functional Immune Response in Rainbow Trout (Oncorrhynkus Mykiss) Infected With Viral Hemorrhagic Septicemia Virus (VHSV) and in Fish Vaccinated With a DNA Vaccine Against VHSV

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CORRELATION OF MRNA AND MICRO-RNA PROFILES AND FUNCTIONAL IMMUNE RESPONSE IN RAINBOW TROUT (*ONCORHYNCHUS MYKISS*) DURING INFECTION WITH *VIRAL HEMORRHAGIC SEPTICEMIA VIRUS* (VHSV) AND IN FISH VACCINATED WITH A DNA VACCINE AGAINST VHSV

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Micro ribonucleic acids (miRNAs) are a diverse class of small (18-22 nucleotides) endogenous RNAs that potently mediate post-transcriptional silencing of a wide range of genes and are emerging as critical regulators of cellular processes. They are transcribed and processed from larger precursors and are incorporated into the RNA-Induced Silencing Complex (RISC), which target specific mRNA sequences, causing either mRNA degradation or translation repression. This results in altered mRNA and protein profiles characteristic of a particular cellular phenotype or physiological state. By targeting immune relevant mRNAs, miRNAs could be involved in controlling the expression of fish immune response genes.

This project aims to analyze mRNA and miRNA expression in organs of vaccinated and non-vaccinated rainbow trout (*Oncorhynchus mykiss*) families showing differential mortality in previous infection trials with the highly pathogenic fish rhabdovirus *Viral hemorrhagic septicemia virus* (VHSV). This talk will discuss our overall strategy and present preliminary data on the expression of miRNAs and the type I interferon-inducible Mx gene in the liver and the skeletal muscle tissue of fish injected with a DNA vaccine encoding the VHSV glycoprotein gene.

We will link mRNA and miRNA profiles with phenotypic, genotypic, and immunological data, which will provide an integrated view of the mechanisms of resistance and the strong protective immune responses provided by vaccination. This information is important in designing effective strategies to mitigate the danger of potential VHS disease outbreaks.

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